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NOTICE OF ALLOWANCE AND FEE(S) DUE

47654

7590

09/15/2010

BAINWOOD HUANG & ASSOCIATES LLC
2 CONNECTOR ROAD
WESTBOROUGH, MA 01581

EXAMINER

CHOUDHURY, AZIZUL Q

ART UNIT

PAPER NUMBER

2445

DATE MAILED: 09/15/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,591	04/08/2004	Nicholas Leavy	1004-128	8114

TITLE OF INVENTION: USE OF PER-FLOW MONOTONICALLY DECREASING TTLS TO PREVENT IDS CIRCUMVENTION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	12/15/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE** OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

47654 7590 09/15/2010
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WESTBOROUGH, MA 01581

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

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nonprovisional	NO	\$1510	\$0	\$0	\$1510	12/15/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHOUDHURY, AZIZUL Q	2445	709-225000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB-122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB-47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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			CHOUDHURY, AZIZUL Q	
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2445

DATE MAILED: 09/15/2010

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 899 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 899 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability**Application No.**

10/820,591

Applicant(s)

LEAVY ET AL.

Examiner

AZIZUL CHOUDHURY

Art Unit

2445

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/26/2010.
2. ☒ The allowed claim(s) is/are 1-15, 21-25 and 39.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Azizul Choudhury/
Examiner, Art Unit 2445

/NIVEK SRIVASTAVA/
Supervisory Patent Examiner, Art Unit 2445

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with David E. Huang on September 8, 2010.

The application has been amended as follows:

Upon entrance of this proposed claim amendment, this listing of claims would replace all prior versions and listings of claims in the Application:

1. (Currently amended) A method of blocking attacks on a protected computer network, comprising:
 - receiving, by processing circuitry, a plurality of packets from a network, each said packet having a packet time to live (TTL) value and belonging to a corresponding packet flow;
 - storing, by the processing circuitry, the smallest packet TTL value received from each said corresponding packet flow; and
 - prior to transmitting each said packet, setting, by the processing circuitry, said packet TTL value to said smallest packet TTL value received for said corresponding packet flow;wherein storing the smallest packet TTL value received from each said corresponding packet flow includes, for each said packet:

if that packet is the first packet received from said corresponding packet flow, then storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow;
if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is less than the stored smallest packet TTL value received from said corresponding packet flow, then storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow; and
if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is greater than the stored smallest packet TTL value received from said corresponding packet flow, then refraining from storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow.

2. (Previously Presented) The method of Claim 1, wherein said storing the smallest packet TTL value further comprises:

associating an epoch with said stored smallest packet TTL value; and
if said epoch is greater than a predefined value, discarding said stored smallest packet TTL value.

3. (Original) The method of Claim 1, further comprising periodically resetting said stored smallest packet TTL value to a maximum value.

4. (Original) The method of Claim 1, wherein said setting said packet TTL value comprises:

determining if said corresponding packet flow is on an unrestricted list;
and if said corresponding packet flow is on said unrestricted list, setting said packet TTL value to a maximum value.

5. (Original) The method of Claim 1, wherein said setting said packet TTL value comprises:

determining if said corresponding packet flow is on an unrestricted list;
and if said corresponding packet flow is on said unrestricted list, leaving said packet TTL value unchanged.

6. (Currently amended) An apparatus for blocking attacks on a protected computer network, comprising:

processing circuitry ~~means~~ for receiving a plurality of packets from a network, each said packet having a packet time to live (TTL) value and belonging to a corresponding packet flow;

processing circuitry ~~means~~ for storing the smallest packet TTL value received from each said corresponding packet flow; and

processing circuitry ~~means~~ for setting said packet TTL value to said smallest packet TTL value received for said corresponding packet flow prior to transmitting each said packet;

wherein said processing circuitry ~~means~~ for storing the smallest packet TTL value received from each said corresponding packet flow includes means for, for each said packet:

if that packet is the first packet received from said corresponding packet flow, then storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow;

if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is less than the stored smallest packet TTL value received from said corresponding packet flow, then storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow; and

if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is greater than the

stored smallest packet TTL value received from said corresponding packet flow, then refraining from storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow.

7. (Currently amended) The apparatus of Claim 6, wherein said processing circuitry means for storing the smallest packet TTL value further comprises:

means for associating an epoch with said stored smallest packet TTL value; and
means for discarding said stored smallest packet TTL value if said epoch is greater than a predefined value.

8. (Original) The apparatus of Claim 6, further comprising means for periodically resetting said stored smallest packet TTL value to a maximum value.

9. (Currently amended) The apparatus of Claim 6, wherein said processing circuitry means for setting said packet TTL value comprises:

means for determining if said corresponding packet flow is on an unrestricted list;
and
means for setting said packet TTL value to a maximum value if said corresponding packet flow is on said unrestricted list.

10. (Currently amended) The apparatus of Claim 6, wherein said processing circuitry means for setting said packet TTL value comprises:

means for determining if said corresponding packet flow is on an unrestricted list;
and
means for leaving said packet TTL value unchanged if said corresponding packet flow is on said unrestricted list.

11. (Previously Presented) An apparatus for blocking attacks on a protected computer network, comprising:

- a packet classifier configured to receive a plurality of packets from a network, each said packet having a packet time to live (TTL) value and belonging to a corresponding packet flow;
- a memory configured to store the smallest packet TTL value received from each said corresponding packet flow;
- a TTL rewrite unit configured to set said packet TTL value to said smallest packet TTL value received for said corresponding packet flow prior to transmitting each said packet; and
- a controller, the controller being configured to, for each said packet:
 - if that packet is the first packet received from said corresponding packet flow, then store in memory the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow;
 - if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is less than the stored smallest packet TTL value received from said corresponding packet flow, then store in memory the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow; and
 - if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is greater than the stored smallest packet TTL value received from said corresponding packet flow, then refrain from storing in memory the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow.

12. (Previously Presented) The apparatus of Claim 11, wherein said memory comprises:
- first control means for associating an epoch with said stored smallest packet TTL value; and

second control means for discarding said stored smallest packet TTL value if said epoch is greater than a predefined value.

13. (Original) The apparatus of Claim 11, further comprising control means for periodically resetting said stored smallest packet TTL value to a maximum value.

14. (Original) The apparatus of Claim 11, wherein said TTL rewrite unit comprises:
first control means for determining if said corresponding packet flow is on an unrestricted list; and
second control means for setting said packet TTL value to a maximum value if said corresponding packet flow is on said unrestricted list.

15. (Original) The apparatus of Claim 11, wherein said TTL rewrite unit comprises:
first control means for determining if said corresponding packet flow is on an unrestricted list; and
second control means for leaving said packet TTL value unchanged if said corresponding packet flow is on said unrestricted list.

Claims 16-20 (Canceled).

21. (Currently amended) A computer program product comprising a non-transitory computer-readable medium having instructions stored thereon that, when performed by a computer, cause the computer to perform the following operations:

receiving a plurality of packets from a network, each said packet having a packet time to live (TTL) value and belonging to a corresponding packet flow;
storing the smallest packet TTL value received from each said corresponding packet flow; and
prior to transmitting each said packet, setting said packet TTL value to said smallest packet TTL value received for said corresponding packet flow;

wherein said instructions for storing the smallest packet TTL value received from each said corresponding packet flow comprise instructions that, when performed by the computer, cause the computer to perform the following operations:

- if that packet is the first packet received from said corresponding packet flow, then storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow;

- if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is less than the stored smallest packet TTL value received from said corresponding packet flow, then storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow; and

- if that packet is not the first packet received from said corresponding packet flow and the packet TTL value of that packet is greater than the stored smallest packet TTL value received from said corresponding packet flow, then refraining from storing the packet TTL value of that packet as said smallest packet TTL value received from said corresponding packet flow.

22. (Previously Presented) The computer program product of Claim 21, wherein said instructions for storing the smallest packet TTL value further comprise instructions that, when performed by the computer, cause the computer to perform the following operations:

- associating an epoch with said stored smallest packet TTL value; and

- if said epoch is greater than a predefined value, discarding said stored smallest packet TTL value.

23. (Previously Presented) The computer program product of Claim 21, further comprising instructions that, when performed by the computer, further cause the computer to perform the following operations:

periodically resetting said stored smallest packet TTL value to a maximum value.

24. (Previously Presented) The computer program product of Claim 21, wherein said instructions for setting said packet TTL value comprise instructions that, when performed by the computer, cause the computer to perform the following operations:

determining if said corresponding packet flow is on an unrestricted list; and
if said corresponding packet flow is on said unrestricted list, setting said packet TTL value to a maximum value.

25. (Previously Presented) The computer program product of Claim 21, wherein said instructions for setting said packet TTL value comprise instructions that, when performed by the computer, cause the computer to perform the following operations:

determining if said corresponding packet flow is on an unrestricted list; and
if said corresponding packet flow is on said unrestricted list, leaving said packet TTL value unchanged.

Claims 26-38 (Canceled).

39. (Previously Presented) The method of Claim 1, wherein:

for each said packet, said packet TTL value is a value stored within the header of that packet; and

the method further comprises transmitting each said packet across the protected computer network, said packet being configured to expire after a number of hops equal to said smallest packet TTL value received for said corresponding packet flow.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: No prior art could be found to teach all of the claimed limitations. In particular, no prior art could be found to teach the claimed technique for storing the smallest value available as the TTL. The technique includes checking the incoming packets to see if they're the first packet received and checking packet TTL values.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIZUL CHOUDHURY whose telephone number is (571)272-3909. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on (571) 272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. C./
Examiner, Art Unit 2445

/VIVEK SRIVASTAVA/
Supervisory Patent Examiner, Art Unit 2445